

What Is Claimed Is:

1. A power supply device, in particular in a vehicle electricelectrical system, having a first voltage system, comprising at least one first generator to which a first voltage regulator is assigned, a battery connected to the generator and consumers switchable to the battery via an ignition switch, and a second voltage system including at least one second generator, to which a second voltage regulator is assigned, and as well as switchable consumers, the second voltage regulator regulating the excitation current flowing through the excitation winding of the second generator, wherein the excitation winding (E2) of the second generator (G2) is connectable via connecting means to a charge storage device for generating an excitation current (IE) in the excitation winding (E2) of the second generator (G2).
2. The power supply device, in particular in a vehicle electricelectrical system, as recited in Claim 1, wherein the connecting means establish a conducting connection at least temporarily between the excitation winding (E2) of the second generator (G2) and the charge storage device.
3. The power supply device, in particular in a vehicle electricelectrical system, as recited in Claim 1 or 2, wherein the connecting means establish the conducting connection after actuation of the ignition switch, at least until starting of the generator (G2).
4. The power supply device, in particular in a vehicle electricelectrical system, as recited in Claim 1, 2 or 3, wherein the connecting means are situated between the excitation winding (E2) of the second generator (G2) and the battery (B1).
5. The power supply device, in particular in a vehicle electricelectrical system, as recited in Claim 4, wherein the connecting means include a voltage transformer (W), in particular a bidirectional d.c./d.c. transformer.

6. The power supply device, in particular in a vehicle electricelectrical system, as recited in Claim 5,

wherein one side of the voltage transformer (W) is at the generator voltage (U2) and the other side is at the generator voltage (U1), these voltages being different and in particular being in the range of 12--14 volts or 36--42 volts.

7. The power supply device in particular in a vehicle electricelectrical system, as recited in Claim 4,

wherein the connecting means include at least one diode (D) and also a resistor (Wi), if necessary, the anode of the diode (D) being connected to the battery (B1) and the cathode being connected to the excitation winding (E2) of the second generator (G2).

8. The power supply device, in particular in a vehicle electricelectrical system, as recited in Claim 4,

wherein the connecting means include at least one switch (S3), in particular in a relay or a switching transistor.

9. The power supply device, in particular in a vehicle electricelectrical system, as recited in Claim 4,

wherein the connecting means include at least one sense path (SP).

10. The power supply device, in particular in a vehicle electricelectrical system, as recited in Claim 1, 2 or 3,

wherein an additional charge storage device is connectable to the excitation winding (E2) of the second generator (G2), the second charge storage device being a battery or a capacitor or a SuperCap and the connection being established after actuation of the ignition switch and maintained until the second generator (G2) has started and is supplying an output voltage.

11. A method for power supply, in particular in a vehicle electricelectrical system, as recited in Claim 8,

wherein the switch (S3) is closed at "ignition on" and is opened again after ramp up of the generator (G2), so that the connection is kept conductive until the second generator has started and is generating an output voltage.

12. The method for power supply, in particular in a vehicle electricelectrical system, as recited in Claim 8,
wherein the switch (S3) remains closed and the two generators are operated in parallel for joint supply of power to one of the voltage systems.